

PLASTIC INLAID MARKERS MIGRATION

VDOT/VAA Asphalt Seminar | Fredericksburg, VA

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Background | *Pavement Markings & Markers*

- **Why Use Them – Safety**

- ❑ **An aid to keep vehicles from departing travel lanes & highway**
- ❑ **52% of fatal crashes are roadway departure crashes** (*FHWA Roadway Departure Strategic Plan, Rev. 2013*)
 - 18,000 fatal roadway departure out of 34,000 total fatal crashes, 2007-2009
- ❑ **Nighttime crash avoidance from Markers** (*CMF Clearinghouse*)
 - Limited access highways up to 33%
 - Two-lane roads up to 24%
- ❑ **VDOT estimates 40 lives saved in Virginia annually from markers**
- ❑ **Enhancement for older drivers in long-range detection**
 - 10K people/day cross the age 65 threshold (*US Census*)

Background | *Raised Pavement Marker (RPM)*



Roads with No RPMs



Roads with RPMs

RPMs are safety devices to provide more positive guidance for motorists in inclement weather and low lights conditions.

Background | *Pavement Markings & Markers*

- **The Challenges for Markings & Markers**

- ☐ Limited visibility in wet conditions (markings)
- ☐ Risk of dislodgment (markers)
- ☐ Durability - subject to years of service on the road surface
- ☐ Be cost- and resource- effective for both installation & maintenance
- ☐ Widespread impacts of any changes to VDOT & contractor business practices
 - Equipment needs
 - Staffing & training needs
 - Product availability
 - Budget needs
 - Program communication & outreach

Background | *Pavement Markings & Markers*

□ How VDOT Overcomes These Challenges

- Investigate new products, technologies or practices to better meet markings/markers challenges
- Monitor & participate in national testing (NTPEP)
- Assess potential benefits, known & potential impacts, and risks to arrive at a decision
 - Validate → Implement → Monitor → Adjust as Needed

□ VDOT's Annual Marking/Marker Investment Question

- Specify the requirements for markers and markings
- Incorporate advancements quickly into paving to leverage program scale

Background | *Where We Install Markers*

- ❑ **VA Supplement to the MUTCD (VaS) provides policy on where markers shall/should/may be used:**
 - **Limited access highways:** shall be installed under most circumstances
 - **Multilane & undivided highways:** shall/should/may be used based on:
 - ADT
 - Speed Limit
 - Lighting
 - Engineering judgment
- ❑ **Spacing and lateral placement as per VaS and Std Dwg PM-8**
- ❑ **VDOT reviewing VaS marking policy to maximize safety & cost benefits**

Background | *Where We Install Markers (Cont.)*

- ❑ **Some existing SRPMs do not meet current requirements:**
 - On low-ADT roads
 - Doubled-up on both sides of the DY – only a single row is necessary under most circumstances
 - Spaced at 40' when only 80' spacing is required
 - Placed adjacent to every left & right turn lane on divided arterials
- ❑ **2020 schedules: reinstall where existing, but meet current spacing requirements**
- ❑ **2021 & beyond schedules: PIMs to be provided only where warranted by VaS**

Background | *State Construction Engineer (SCE) Memos*

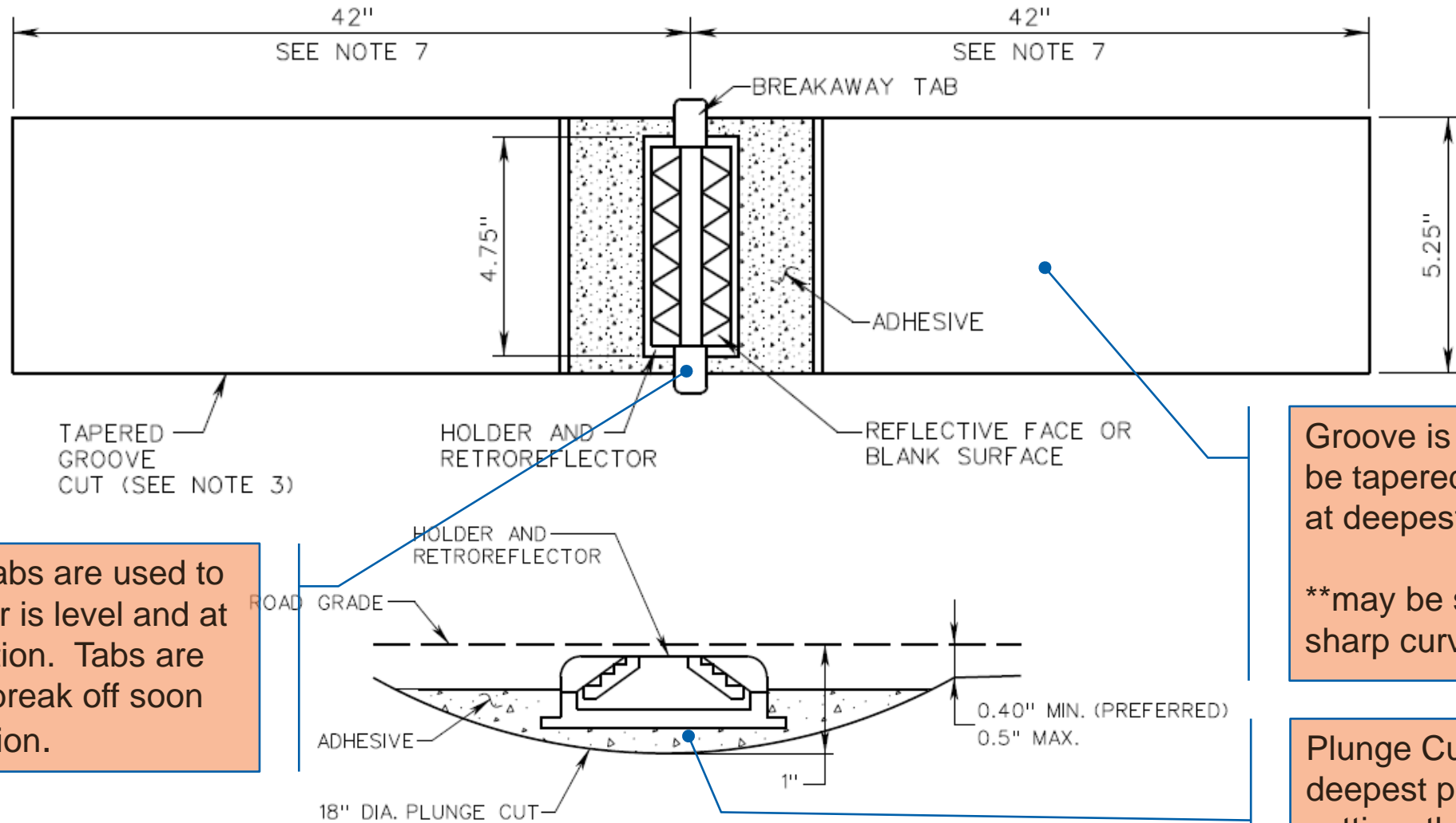
- ❑ **August 2019: First SCE memo announcing that PIMs will be used instead of SRPMs, effective:**
 - **Paving Schedules: all 2020 schedules and beyond**
 - **All other Contracts advertised after 1/1/20**
 - **Active Contracts: reviewed on case-by-case basis**
- ❑ **Dec. '19 memo & Jan. '20 response to questions: existing SRPMs within active contract limits shall be removed, except:**
 - **Contractor has already completed work within that area**
 - **SRPM removal must align with general scope of work for that contract**
 - **VDOT will continue to maintain lenses in existing SRPMs**

www.virginiadot.org/business/resources/const/default.asp

Background | *Current Status of Migration*

- ❑ Completed I-295 test installation in August 2019
- ❑ PIM Special Provision completed and issued
- ❑ PIM Pay Items are set up and effective (UOM of EACH)
- ❑ Standard Drawing PM-8 update completed and issued
 - Drawing PM-9 was also updated: ~~6"~~ 7" space between DY lines
- ❑ Centerline Rumble Stripe (RS-3) updates in the works
- ❑ PIMs have been added to Approved Products List #22

PIM Installation | *New Standard Drawing PM-8*



Breakaway tabs are used to ensure holder is level and at proper elevation. Tabs are expected to break off soon after installation.

Groove is 7ft long** and may be tapered or beveled. Depth at deepest point = 0.4".

**may be shortened to 54" on sharp curves

Plunge Cut is 1" deep at its deepest point. After cutting, the "lake" gets filled with epoxy.

Single Lens System

Evaluation of drainage on sloped road. Some water ponding but reflector above water line.





Bid Prices To Date**

- ❑ **\$48 average & \$43 weighted average cost per PIM**
 - In 2018 the Kentucky Transportation Cabinet reported statewide average bid price of \$30 Each
 - Removal of existing SRPMs isn't a separate pay item

- ❑ **\$30 additional cost per PIM (average) when sealing is specified**

*** Based on publicly available Dec. '19 and Jan. '20 bid tabulations for 2020 paving schedules*

Special Circumstances

- ❑ **Latex Modified**: all existing SRPMs must be removed and replaced with PIMs
- ❑ **THMACO**:
 - As per Chief Engineer 11/7 email, PIMs will be installed on THMACO schedules when there are existing SRPMs
 - Special care must be taken when existing concrete road is being overlain with THMACO
- ❑ **CLRS**: PIMs will be addressed in updated Std Dwg RS-3
- ❑ **Bridge Decks**: only on new bridge decks > 200ft long and functionally classified minor arterial or higher

Next Steps

- ❑ **Finalize remaining spec & standard changes**
 - MD/CD to address specs for sealing on asphalt or concrete
 - TED's Safety section to finalize RS-series Standards
- ❑ **Potential VaS policy updates on where to install markers**
- ❑ **Monitor performance and (if necessary) adjust practices:**
 - Usage & installation practices
 - 2020 “occlusion conclusions” groove performance research
 - Lifecycle maintenance consistency
- ❑ **Track and report progress of statewide PIMS transition**
- ❑ **Continue marking products reviews & advocate for product enhancements to improve night time visibility & durability**



THANKS!

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PIM Installation | *Step 1: Cut the Groove*



PIM Installation | *Step 2: partially fill Plunge Cut with Epoxy*



PIM Installation | *Step 3: Place the Marker & Finish Epoxy*



Fill the plunge cut until the PIM holder's "teeth" are fully covered

